

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Office Action dated January 20, 2006 has been received and its contents carefully reviewed.

Claims 1 and 17 are currently amended. Claims 1-32 are currently pending. Reexamination and reconsideration of the pending claims is respectfully requested.

In the Office Action, claims 1-32 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,043,511 to Kim (hereinafter “Kim”) in view of U.S. Publication No. 2002/0117691 to Choi et al. (hereinafter “Choi”) and in further view of Applicant’s Related Art (hereinafter “ARA”).

Independent claims 1 and 17 are allowable over the cited references in that the claims each recite a combination of elements including, for example, “the gate electrode, the gate line and the gate pad electrode have a double-layered structure...wherein the first barrier metal layer is interposed between the substrate and the first copper layer and wherein the first barrier metal layer and the first copper layer have a smooth taper shape without any steps on their sides...the data line, the source and drain electrodes...and the data pad electrode have a double-layered structure...wherein the second barrier metal layer is interposed between the substrate and the second copper layer.” None of the cited references, singly or in combination, teaches or suggests at least these features of the claimed invention.

Specifically, present claims 1 and 17 are different from the modified invention of Kim in that in claims 1 and 17 “the gate electrode, the gate line and the gate pad electrode have a double-layered structure...wherein the first barrier metal layer is interposed between the substrate and the first copper layer.” In contrast, Kim merely teaches a double layered structure of Al-Nd and Mo or Cr and Al-Nd. See column 6, lines 55-65; Fig. 13A. Kim does not teach “a first copper layer,” as acknowledged by the Examiner on page 3 of the Office Action. Furthermore, present claims 1 and 17 are different from the modified invention of Kim in that in claims 1 and 17 “the data line, the source and drain electrodes ...and the data pad electrode have

a double-layered structure... wherein the second barrier metal layer is interposed between the substrate and the second copper layer.” Again, Kim does not teach these features, as acknowledged by the Examiner on page 3 of the Office Action.

The Examiner relies on Choi to allegedly teach double-layered gate line and data line assemblies including a copper layer and a barrier metal layer. However, Applicant respectfully submits Choi fails to cure the deficiencies of Kim. Choi merely discloses a double-layered data line assembly where the bottom layer may be formed of copper and the top layer may be formed of chrome. See paragraph [0125]. Choi discloses a double-layered gate line assembly formed on a buffer layer where the bottom layer may be formed of copper and the top layer may be formed of chrome. See paragraph [0132]. Therefore, Choi does not teach or suggest “the first barrier metal layer is interposed between the substrate and the first copper layer” or “the second barrier metal layer is interposed between the substrate and the second copper layer.” Choi teaches that copper is a lower layer in both the gate line assembly and the data line assembly. Thus, there is no teaching or suggestion in Choi that a barrier metal layer is interposed between the underlying substrate and a copper layer. Therefore, Choi does not cure the defects associated with Kim.

The Examiner relies on ARA to allegedly teach that the first barrier layer and the first copper layer have a smooth taper shape without any steps on their sides. However, Applicant respectfully submits that ARA fails to cure the deficiencies of both Kim and Choi. None of the cited references, singly or in combination, teaches or suggests “the first barrier metal layer is interposed between the substrate and the first copper layer” or “the second barrier metal layer is interposed between the substrate and the second copper layer,” as recited in independent claims 1 and 17.

Furthermore, Applicant respectfully submits that there is no motivation for one of ordinary skill in the art to combine Kim, Choi and ARA and arrive at the claimed invention with any reasonable expectation of success. Kim is drawn to decreasing the number of photolithography steps, while Choi is drawn to reducing parasitic capacitance when increasing the opening ratio of liquid crystal displays. ARA discusses a related art liquid crystal display processing method. One of ordinary skill in the art would not look to issues with parasitic

capacitance or opening ratio to aid in reducing photolithography steps. Therefore, Applicant respectfully submits that Kim, Choi and ARA are non-analogous art for purposes of analyzing the obviousness of the subject matter at issue. Applicant further respectfully submits that the motivation to combine the references comes from the present invention, and not from Kim, Choi, or ARA, which is impermissible. Accordingly, Applicant respectfully submits that claim 1, claims 2-16 which depend therefrom, claim 17, and claims 18-32 which depend therefrom, are allowable over Kim in view of Choi in further view of ARA.

Applicants believe the foregoing remarks place the application in condition for allowance and early, favorable action is respectfully solicited.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

Dated: April 19, 2006

Respectfully submitted,

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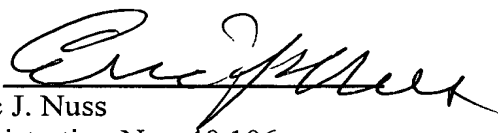
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